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## THE ROTIFERA OF SANDUSKY BAY.

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### I.

In order that the title and the substance of my paper may not appear to be out of all reasonable proportion, permit me an introductory word of explanation. In consequence of the liberality of the Trustees of the Ohio State University, I now have a Lake Laboratory, located on Sandusky Bay, where I have spent a part of the present summer vacation and where I expect to spend more or less of subsequent ones. The study of the Rotifera of the bay will be continued from year to year, and it is my purpose to report from time to time the work accomplished. This list, then, is only a partial one, giving such species as have been identified, their habitats, etc., with descriptions of such as appear to be new.

While living at Buffalo it was my pleasure to study Rotifera somewhat at the eastern end of Lake Erie. Very few of my notes have been published, but the resumption of study at Sandusky renews acquaintance with many old friends, which it has been a delight to meet and greet. This charming group is one of deep interest everywhere, but in no situation may one expect to find a richer rotiferal fauna or one with more unique forms than in our Great Lakes.

Since the brief papers read by myself on these creatures at the Cleveland and first Pittsburg meetings some work has been done and published on Rotifera of the Great Lakes, notably by Mr. H. S. Jennings. His paper, A List of the Rotatoria of the Great Lakes and Some of the Inland Lakes of Michigan, will often be referred to by the name of the author in the course of my remarks.

Sandusky is situated on a peninsula, having the wide glacial estuary of the Sandusky river, known as the West Bay, on one side, and on the other the East Bay, which is a shallow body of water cut off from the lake by a sandbar, known as Cedar Point, several miles long. This East Bay is the site where the work of this paper was done. The bay extends to the southeast several miles, ending in extensive marshes, where a variety of marsh plants abound in great profusion. Moreover, there are sheltered ponds and marshes on the Point, which are simply bodies of water resting in basins of sand, maintained at a constant level by the influence of the lake. The place appears, therefore, to be an ideal home of Rotatoria, and the short time thus far spent in finding them out has not been disappointing.

The systematic arrangement followed is that of Hudson and Gosse's Rotifera. References to this work will be simply by the authors' names.

#### FAMILY I. FLOSCULARIADÆ.

##### FLOSCULARIA, Oken.

###### 1. *F. ornata*, Ehrenberg.

Very common on the dissected leaves of *Utricularia*, on the under side of leaves of *Nymphæa* and *Nelumbium*, in the bay and in the marshes and coves.

I often found the egg placed high in the tube, so that when the animal retreated it passed below the egg.

###### 2. *F. cornuta*, Dobie.

Few of this distinct species were found; elsewhere, Buffalo and Central Michigan, I have found it as abundant as *ornata*.

###### 3. *F. Millsii*, Kellicott.

In abundance in *Utricularia* growing in a marsh on Cedar Point. This makes the third station for this beautiful floscule, viz.: Black Creek, Ontario, Canada; Sidney, New South Wales, by Mr. Thomas Whitelegge; and Sandusky Bay, Ohio.

I have again measured an average example, and find sub-

stantial agreement with the dimensions given in my original paper,\* whilst that of the antipodal form was scarcely half as large. Again, in regard to the foot, I may say that there is no attenuated pedicle, but as Mr. Whitelegge says, "A short [and stout] immovable stalk, which is not affected when the animal retracts or extends ;" the three ring-like protuberances at the end of the foot, just above the stalk, described by him, I am unable to make out.

4. *F. campanulata*, Dobie.

Exceedingly abundant in the quiet marshes, found on a variety of plants, but most numerous on young branches of *Utricularia*.

5. *F. ambigua*, Hudson.

With the preceding ; much less numerous.

6. *F. mutabilis*, Bolton.

Few taken in the skimming net and by straining water from the faucet.

FAMILY II. MELICERTADÆ.

MELICERTA, Schrank.

7. *M. conifera*, Hudson.

Very abundant, especially under floating leaves of *Nelumbium*. Its tubes were often found in clusters similar to those of *M. ringens*. I have found groups of tubes fully one-eighth of an inch long and containing not less than twenty-five tubes.

8. *M. flocculosa*, n. s.

Lobes wide, expanding fully twice the greatest width of the stout body ; antennæ very short ; tube gelatinous, with much adherent floccose, thus resembling a dense tube of a floscule.

Two individuals of this fine species were found under floating leaves of *Nelumbium luteum*. It appears to be closely related to *M. tubicolaria*. It differs from that species in

\* TRANSACTIONS of this Society, Cleveland meeting, 1885, page 48.

having a much stouter body, the lobes relatively narrower, in having a spatulate chin and very short antennæ; *tubicolaria* has these organs very long. The tube appears to have the floccose incorporated with the gelatinous matter. This, I think, is done by accumulating it in the ciliated cup and placing it on the margin and surface of the tube, much as *Æcistes longicornis* may be seen to do.

One characteristic, large, brown egg was noticed in the tube of the largest one.

The size is large, but the record of its exact dimensions was lost.

LIMNIAS, Schrank.

9. *L. ceratophylli*, Schrank.

Very few were found. I have found this abundant in the Niagara River.

10. *L. Shiawasseensis*, Kellicott.

Very rare.

11. *L. annulatus*, Bailey.

Very common on aquatic plants in coves and marshes.

CEPHALOSIPHON, Ehrenberg.

12. *C. limnias*, Ehrenberg.

Abundant on *Utricularia* and water-lily pads.

ÆCISTES, Ehrenberg.

13. *Æ. crystallinus*, Ehrenberg.

Not uncommon.

14. *Æ. longicornis*, Davis.

Not uncommon.

I find that this interesting rotiferon, as I reported several years ago, has a well-formed cylindrical or somewhat vase-shaped tube, covered with floccose, arranged in transverse lines, giving the striated appearance alluded to by Mr. Davis. When the focus is deeper the tube looks like a piece of animal's hide with its long shaggy hair. This disposition of the material is doubtless accomplished by means of the stout

ciliated chin. Mr. Jennings finds the tubes of definite form.

The corona appears to me to be more strongly bilobed than the extant figures represent it. The tube closes when the animal retires within, and as it cautiously returns, *one* antenna, partly folded over the front, precedes, much like the antenna of *C. limnias*, although without the exploring motion of that species; later the other long antenna unfold and extend its sensitive setæ.

15. *Æ. mucicola*. Kellicott.

Somewhat rare. The gelatinous balls of the alga in which it lives are numerous enough, and occasionally a rotiferon is seen protruding or suddenly retreating within its domicile for protection.

LACINULARIA, Schweigger.

16. *L. socialis*, Ehrenberg.

Very abundant on *Nymphæa* and *Nelumbium*. I have seen colonies a fourth inch across.

MEGALATROCHA, Ehrenberg.

17. *M. alboflavicans*, Ehrenberg.

With *Lacinularia*, less common, colonies smaller.

CONCHILUS, Ehrenberg.

18. *C. volvox*, Ehrenberg.

Few colonies seen from marsh-water.

FAMILY III. PHILODINADÆ.

PHILODINA, Ehrenberg.

19. *P. roseola*, Ehrenberg.

Common on all sorts of aquatic vegetation.

20. *P. citrina*, Ehrenberg.

Not uncommon, with the last.

21. *P. megalatrocha*, Ehrenberg.

Common.

22. *P. aculeata*.

Not uncommon among roots of duck-weed in sheltered situations.

ROTIFER, Schrank.

23. *R. vulgaris*, Schrank.

Abundant.

24. *R. tardus*, Ehrenberg.

Among algæ.

25. *R. macroceros*, Gosse.

Common in the forks of *Utricularia* partly surrounded by debris.

26. *R. macrurus*, Schrank.

Many seen.

CALLIDINA, Ehrenberg.

27. *C. elegans*, Ehrenberg.

Several taken among weeds in the marshes. It was so restless that I do not feel sure of the identification.

#### FAMILY VI. ASPLANCHNADÆ.

ASPLANCHINOPS, de Guerne.

28. *A. myrmelio*, Ehrenberg.

Few were collected in marsh-water. I do not find the ovary so large as figured, but of characteristic horse-shoe shape. I find the trophi to agree well with the descriptions.

#### FAMILY VII. SYNCHÆTADÆ.

SYNCHÆTA, Ehrenberg.

29. *S. tremula*, Ehrenberg.

Rare in marsh-water. I am not wholly satisfied that it is *tremula*.

#### FAMILY VIII. TRIARTHRADÆ.

POLYARTHRA, Ehrenberg.

30. *P. platyptera*, Ehrenberg.

Common in water-supply and among aquatic plants.

## TRIARTHRA, Ehrenberg.

31. *T. longiseta*, Ehrenberg.

Not uncommon in the water-supply. The setæ of one were found to be more than three times the length of the body.

## FAMILY IX. HYDATINADÆ.

## PLÆSOMA, Herrick.

32. *P. lenticulare*, Herrick.

A few dead ones in sediment from water-supply.

## FAMILY X. NOTOMMATADÆ.

## NOTOMMATA, Gosse.

33. *N. aurita*, Ehrenberg.

Among growing water-plants in clear water. Several seen.

34. *N. lacinulata*, Ehrenberg.

Very common among algæ.

## COPEUS, Gosse.

35. *C. cerebrus*, Gosse.

Under *Nelumbium* leaves.

## PROALES, Gosse.

36. *P. decipiens*, Ehrenberg.

In water from marsh.

37. *P. gibba*, Ehrenberg.

Not uncommon among roots of duck-weed growing in shallow pools along edges of the marshes.

38. *P. sordida*, Gosse.

Same localities as the preceding species.

## FURCULARIA, Ehrenberg.

39. *F. longiseta*, Ehrenberg.

Marsh water.

Numerous species of this family besides those mentioned were found and studied, but the identification was not satisfactory. They may wait for a future opportunity.



## FAMILY XI. RATTULIDÆ.

## MASTIGOCERCA, Ehrenberg.

40. *M. carinata*, Ehrenberg.

Among algæ. I have not found the ruby-colored variety common at Corunna, Mich., and which Jennings found in Lake St. Clair.

41. *M. bicornis*, Gosse.

Among duck-weed along shore. Not common.

42. *M. lata*, Jennings.

Rather common in filterings from water-supply.

## RATTULUS, Ehrenberg.

43. *R. sulcatus*, Jennings.

Few under floating *Nelumbium* leaves.

## CÆLOPUS, Gosse.

44. *C. porcellus*, Gosse.

Common.

45. *C. tenuior*, Gosse.

Common in sediment from marshes.

## FAMILY XII. DINOCHARIDÆ.

## SCARIDIUM, Ehrenberg.

46. *S. longicaudatum*, Ehrenberg.

Very common.

## STEPHANOPS, Ehrenberg.

47. *S. lamellaris*, Ehrenberg.

Common among water drained from duck-weed, and among algæ.

48. *S. chlæna*, Gosse.

Several seen among *Utricularia* from marsh.

## FAMILY XIII. SALPINADÆ.

## SALPINA, Ehrenberg.

49. *S. brevispina*, Ehrenberg.

Very common among bladderwort and duck-weed.

50. *S. ventralis*, Ehrenberg.

Common with the preceding.

FAMILY XIV. EUCHLANIDÆ.

EUCHLANIS, Ehrenberg.

51. *E. dilatata*, Ehrenberg.

Common among shore plants.

52. *E. triquetra*, Ehrenberg.

With the preceding.

FAMILY XV. CATHYPUADÆ.

CATHYPNA, Gosse.

53. *C. luna*, Ehrenberg.

Common among algæ in quiet pools.

DISTYLA, Eckstein.

54. *D. Ohioensis*, Herrick.

Not common ; among roots of *Spirodela polyrrhiza*.

MONOSTYLA, Ehrenberg.

55. *M. lunaris*, Ehrenberg.

Common.

56. *M. bulla*, Gosse.

Common among vegetation everywhere.

57. *M. quadridentata*, Ehrenberg.

Less common than the last ; found with it.

FAMILY XVI. COLURIDÆ.

COLURUS, Ehrenberg.

58. *C. deflexus*, Ehrenberg.

Very common.

METOPEDIA, Ehrenberg.

59. *M. lepadella*, Ehrenberg.

Abundant.

60. *M. solidus*, Gosse.

Rare.

61. *M. oxysternum*, Gosse.

Few seen.

#### FAMILY XVII. PTERODINADÆ.

PTERODINA, Ehrenberg.

62. *P. patina*, Ehrenberg.

Common.

63. *P. reflexa*, Gosse.

Rare.

#### FAMILY XVIII. BRACHIONIDÆ.

BRACHIONUS, Ehrenberg.

64. *B. militaris*, Ehrenberg.

Very common, in water-supply and among plants along shore.

NOTEUS, Ehrenberg.

65. *N. quadricornis*, Ehrenberg.

Few in shallow pools mantled by Lemna.

#### FAMILY XIX. ANURÆADÆ.

ANURÆA, Gosse.

66. *A. cochlearis*, Gosse.

Extremely abundant in water-supply of Sandusky.

67. *A. stipitata*, Ehrenberg.

Abundant in the water supply of Sandusky.

Nearly or quite as abundant as the last ; readily separated by its shape as shown by Gosse and by the tessellation of the dorsal shield. In *A. cochlearis* there is a dorsal keel extending from posterior spine to the cervical plate ; in the other, the two middle rows of dorsal plates are alternately and irregularly hexagonal and pentagonal, breaking the dorsal ridge.